



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENTION)

BACHELOR OF EDUCATION (SPECIAL NEEDS EDUCATION)

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF SCIENCE (BIOLOGY)

SZL 200 VERTEBRATES ZOOLOGY

DATE: 2/6/2022

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question one and any other two questions

QUESTION ONE (30 MARKS)

- a) Differentiate between cephalization and segmentation (2 marks)
- b) Outline three features of amphioxus that suggest an invertebrate ancestry (3 marks)
- c) Describe the circulatory system in urochordates (3 marks)
- d) By use of a well labelled diagram **ONLY**, outline four key chordate characteristics (4 marks)
- e) Describe three reproductive adaptations in elasmobranchs (3 marks)
- f) Explain how the following are adapted to terrestrial life
 - i. amniotic egg (3 marks)
 - ii. Mammalian Kidney (3 marks)
- g) Identify three modifications in the reptilian endoskeleton that enabled them to become fully terrestrial (3 marks)
- h) Explain why:
 - i. Beaks and feet of birds show greater diversity in structure than the rest of the body (2 marks)
 - ii. Polyandrous mating systems are more rare than polygynous ones (2 marks)
 - iii. the vertebral column is lacking in the formative stages of most vertebrates but appears later in adult forms (2 marks)

QUESTION TWO (20 MARKS)

- a) Describe the cause and significance of adaptive radiation in vertebrate evolution (5 marks)
- b) Discuss the rise and fall of the amphibians (15 marks)

QUESTION THREE (20 MARKS)

- a) Compare and contrast the anatomy of hag fish and sharks. (10 marks)
- b) Explain the significance of teleosts in vertebrate evolution. (10 marks)

QUESTION FOUR (20 MARKS)

Giving supportive evidence, discuss the origin of mammals

QUESTION FIVE (20 MARKS)

Discuss factors that have contributed to the success of birds in the aerial environment